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EMPLOYMENT RESEARCH

Realistic Local Job Multipliers

Timothy J. Bartik and Nathan Sotherland

ARTICLE HIGHLIGHTS

- *Improved estimates show state and local job multipliers are about one-quarter lower than commonly assumed by economic development policymakers.*
- *Multipliers are lower because commonly used models do not adjust for how job growth increases local land prices, wages, and other costs.*
- *We estimate job multipliers are similar regardless of community or market size.*
- *Local job multipliers are higher when the employed share of the population is lower.*
- *High-tech industries in high-tech areas can have multipliers twice as high as those of other industries, reflecting greater benefits of clustering near other similar firms.*

Economic development policymakers often claim large job multipliers. For the recent Amazon project in New York, the claimed job multiplier for New York State was 2.7—for every 100 jobs at Amazon, 170 other jobs would result.

At the state level, job multipliers are often claimed to be 2.5 to 4.0, while for local labor markets, such as metropolitan areas, job multipliers are claimed to be 2.0 or higher. High-tech multipliers are sometimes claimed to be as great as 6—each high-tech job will create 5 other local jobs.

Correctly estimating the multiplier is important because size does matter. Consider the benefits for local residents from firms locating in their area in exchange for tax incentives. Benefits include increases in local employment-to-population ratios. However, these benefits depend on total jobs created, which scale roughly proportionately with the multiplier. If the multiplier is twice as big, the benefit-cost ratio will be twice as big.

Currently claimed multipliers rest on many assumptions. Compared to prior models, we take a more data-driven approach with fewer assumptions, and, crucially, we allow for cost feedbacks. When a local economy grows, local costs (land prices, wages) rise. Higher local costs repel other firms, lowering multipliers. Excluding cost feedbacks could lead to overestimated multipliers.

Our estimates lead to several important findings:

- 1) **Job multipliers are lower than commonly assumed.** We find job multipliers about one-quarter lower than is often expected: at the state level, around 2.0 rather than 2.7; at the local level, around 1.5 rather than 2.0.
- 2) **As a result, benefit-cost ratios for incentives are lower.** These new estimates imply benefit-cost ratios for incentives that would be about one-quarter lower.
- 3) **Even smaller areas have similar multipliers.** Multipliers don't increase for larger states

or larger local labor markets. Advantages of larger size are offset by disadvantages; more population might increase congestion.

- 4) **Multipliers are localized.** County multipliers are only one-quarter below local labor market multipliers. Local labor market multipliers are only one-quarter below state multipliers.

Higher costs reduce the net multiplier by one-quarter.

- 5) **Multipliers increase with more available labor.** Local multipliers may be 5–15 percent higher in local labor markets with a depressed employment-to-population ratio.
- 6) **High-tech multipliers are higher, but only in areas with preexisting high-tech clusters.** High-tech multipliers in local labor markets may be as high as 2.9, but only in areas with significantly more high-tech clusters than the national average. High-tech clusters benefit high-tech firms by allowing workers and ideas to migrate from one firm to another.

How Multipliers Evolve

Creating jobs at a new or expanded facility may immediately spur the creation of other jobs in the area for two reasons:

- 1) **Supplier linkages.** The new or expanded facility may purchase from local suppliers, increasing these suppliers' sales and their need for more workers.
- 2) **Worker demand.** Workers at the new or expanded facility, and workers at the facility's suppliers, may spend money at local restaurants, brewpubs, grocery stores, hardware stores, farmers' markets, clothing stores, yoga studios, etc. This local spending will in turn create jobs in these service industries. In addition, some of these goods and services

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Realistic Local Job Multipliers

will be produced locally (beer from breweries, produce from farmers, yoga instructors from a nearby college), which will also generate local jobs.

However, these initial job effects can eventually produce broader impacts, both good and bad:

- **Cost feedbacks.** Job growth increases demand for local land and labor, which will consequently increase land prices and wages. As a result, other businesses will find it more expensive to hire workers or rent a building. These increased costs will discourage job creation.
- **Agglomeration economies or industry cluster spillovers.** For some industries and areas, a greater concentration of similar jobs or workers may increase productivity. In high-tech industries, especially, ideas (and workers) may move between firms. Higher productivity will make the area

more competitive for adding jobs.

How do these factors play out over time? The supplier and worker demand effects begin immediately but continue to increase as local suppliers and retailers gear up production. The negative effects of cost feedbacks take longer to become apparent, as firms only gradually adjust their job creation decisions in response to higher costs. Cluster spillovers, when they're present, also take some time to occur.

Figure 1 shows our estimates of how the typical local job multiplier evolves over time. The immediate multiplier is 1.4: for every 100 jobs created at a new or expanded facility, another 40 local jobs would also be created very quickly. This multiplier expands over the next two years to 1.9, due to the creation of another 50 jobs as local suppliers, retailers, and other service-providers respond to the increased demand for their wares. However, the negative effects of higher costs then begin to kick in. These higher costs destroy about 40 jobs, reducing the net

multiplier after five years to 1.5. The multiplier approximately stabilizes after this point.

Because most current estimates of the job multiplier ignore cost feedback effects, they conclude that the multiplier is 1.9 or 2.0, about one-fourth higher than the true long-run multiplier.

Differences in Multipliers

These multiplier estimates are for a local labor market, which we define as the *commuting zone*—groups of U.S. counties within which there is significant commuting. What about other types of areas?

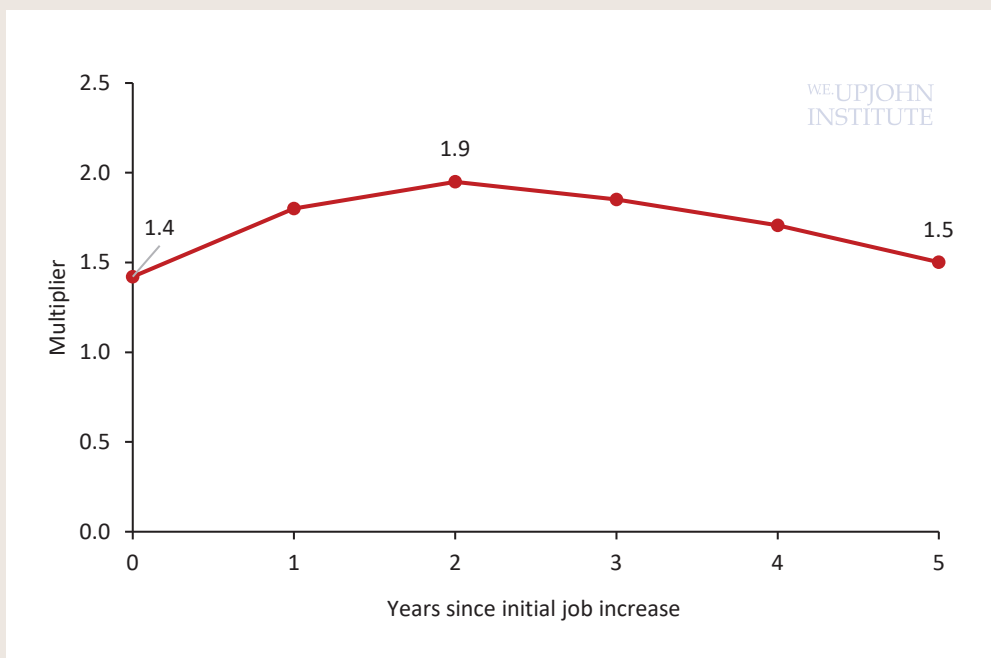
At the state level, the long-run multiplier is about one-quarter higher, at 1.9 rather than 1.5 (Table 1). States are big enough to include more suppliers. In addition, if the new jobs create some fiscal benefits, the state government may cut taxes or increase spending, boosting the state economy.

At the smaller, county level, the long-run multiplier is about one-quarter lower, at 1.1 rather than 1.5. Some of the supplier and service jobs created in the commuting zone will be outside the county in which the new or expanded facility is located, thus lowering the county multiplier.

However, across commuting zones of different sizes, we find similar long-run multipliers. This is surprising. Wouldn't larger commuting zones have more suppliers and retailers whose job creation would be stimulated? Yes, but larger commuting zones also have more problems with higher costs and congestion. As a larger commuting zone gets more jobs, land may become scarcer, roads more crowded, etc. These congestion effects reduce the multiplier. Apparently, the advantages of more suppliers and retailers in larger commuting zones are roughly offset by the larger congestion costs. As a result, even smaller commuting zones can count on at least some multiplier effects.

Besides the size of the area, multipliers are affected also by local labor supply conditions. In

Figure 1 Local Job Multiplier



SOURCE: Authors' calculations.

commuting zones with a lower share of the population aged 25–54 in employment—the so-called prime-age employment-to-population ratio—the multiplier is slightly higher, at 1.6 rather than 1.5.

Furthermore, some industries have higher multipliers than others. For example, multipliers can be significantly higher for high-tech industries, at 2.9 rather than 1.5. This only holds, however, in commuting zones that already have significantly above-average high-tech clusters: commuting zones whose high-tech employment share is in the top one-fifth of all commuting zones (Figure 2). In more average commuting zones, with a more average high-tech industry share, the high-tech job multiplier is only 1.7, which is close to the average multiplier for all industries.

The Advantages of More Flexible Models

We have calculated all these multipliers using a strategy relying on national increases in demand for an area's specialized industries. This strategy imposes few assumptions and allows the data to drive the estimation.

In contrast, the predominant approach used by most economic development policymakers is regional input-output models. These models rely on national relationships of the inputs industries purchase from each other, as well as how much workers buy from retailers and other stores. The models then apply assumptions about the proportions of these purchases that come from local suppliers and retailers. These assumptions may not be correct, and there is no guarantee that relationships that hold nationally also hold for a given local area. Most importantly, however, regional input-output models do not allow for any negative impacts from higher local costs. Yet, our results show such negative cost feedback is important, reducing long-run job multipliers by roughly one-quarter.

Table 1 Long-Term Job Multipliers

	Commuting zones	States	Counties
Baseline assumptions	1.5	1.9	1.1
Low employment rates	1.6		
High-tech jobs in high-tech cluster	2.9		

SOURCE: Authors' calculations.

What Is Needed: Realistic Multipliers

Large multipliers are not magic pixie dust that should be sprinkled on every economic development project to give it a large payoff. Job multipliers certainly exist: an economic development project that directly creates jobs will also induce some additional, local spinoff jobs. But the number of these spinoff jobs is less than is often claimed.

What should policymakers do? When evaluating projects, we recommend that the multipliers from regional input-output models should be scaled back. Does the project still make sense if the job multiplier is one-quarter to one-third less than the number “estimated” by a regional input-output model?

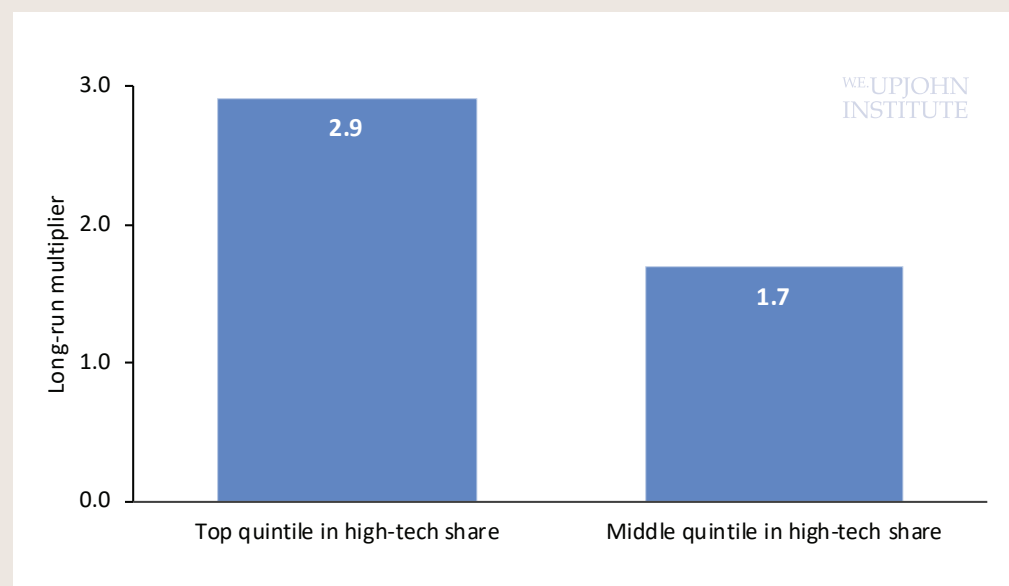
More generally, we need to invest in developing better estimates of job multipliers and applying them under diverse circumstances. We hope our paper will lead to further work that helps inform policymakers about what multipliers might be realistic for different industries in different local economies.

This article draws on research from an Upjohn Institute working paper, which can be found at https://research.upjohn.org/up_workingpapers/301.

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Figure 2 High-Tech Multiplier in Areas with Different Current High-Tech Clusters



SOURCE: Authors' calculations.

[Job] Locked and [Un]loaded

The Effect of the Affordable Care Act Dependency Mandate on Reenlistment in the U.S. Army

Michael S. Kofoed and Wyatt J. Frasier

One concern that policymakers have regarding employer-sponsored health insurance is “job lock” and its effects on labor markets. Workers value health benefits, but health benefits are not transferable across jobs. Thus, a worker could want to pursue a more desirable job opportunity but may choose not to because that worker might lose her health insurance coverage. This condition could cause a worker to forgo career satisfaction or promotion or advancement. Policymakers worry about this phenomenon because it may limit worker effectiveness and lower the incentive toward entrepreneurship.

One goal of the Affordable Care Act (ACA), passed in 2010, is to increase the portability of health insurance across jobs. In our study, we examine the effect of the dependent mandate (in which young adults under 26 years old are permitted to remain on their parents’ health insurance) on reenlistment rates for soldiers in the U.S. Army, a relatively healthy group for whom we can observe many characteristics typically not available for private-sector workers. We use

variation from the policy change to compare soldiers aged 23–25 to those aged 27–30. We compare these groups before and after the passage of the ACA. While the younger group gains access to their parents’ health insurance after ACA enactment—even if they leave the army—the older group does not. This difference-in-differences approach allows us to estimate the causal effect of having health insurance from an external source—one’s parents—on reenlistment of active-duty military members in the army. We find that reenlistment rates were similar for soldiers aged 23–25 and 27–30 before the ACA, but once soldiers under 26 became eligible for their parents’ health insurance, the younger soldiers began to leave the army at a rate 5 percent higher than before the policy change, while rates for the older soldiers did not change appreciably. Moreover, the increase in leaving was concentrated among soldiers with higher test scores. It appears that flexibility achieved through the ACA may be bad for the firm (in this case the U.S. Army) because it is losing some of its most talented employees

once job lock is removed. However, the outcomes may be positive for the overall labor market and for affected individuals, who now have greater ability to pursue additional education and/or labor market prospects.

Background

Analyzing “job lock”—that fear of losing health benefits prevents workers from easily changing jobs, attending college, or starting a business—is difficult with traditional survey data because important considerations such as the health status of the worker, differences in insurance generosity, and whether a worker quit or was fired are generally unknown. However, the U.S. Army serves as a perfect “laboratory” for this question.

Through affiliation with the United States Military Academy, we have access to detailed data regarding soldiers and dependents from the Office of Economic and Manpower Analysis. In our data, we observe a soldier from the day she joins the army to the day she separates. Our office has begun to link these data to those from other federal agencies to understand what happens when a soldier leaves the army. When a soldier joins the army, she signs a contract that binds her to the military for between three and six years. During military service, soldiers must maintain strict health and fitness requirements, but they receive free health insurance (called TRICARE) and are compensated at the same fixed-rate schedule (within pay grade). At the end of an enlistment contract, the army evaluates the soldier and her job performance and then decides whether to make an offer of reenlistment;

ARTICLE HIGHLIGHTS

- *We test whether access to parents’ health insurance led soldiers to not reenlist in the army.*
- *The ACA allowed people under age 26 to stay on their parents’ health insurance.*
- *We compare soldiers aged 23–25, who gained access, to soldiers aged 27–30, who did not.*
- *We find the younger soldiers’ reenlistment rates fell 5 percent relative to the older soldiers’ rates.*
- *Younger soldiers leaving were more likely to enroll in college, possibly helping their job opportunities.*

if offered, the soldier then chooses whether to reenlist or separate. These institutional characteristics allow us to control for many factors that could affect a person's employment decision that are not available in traditional labor market data.

Divergence in Reenlistment Rates

We compare reenlistment rates for two age groups of soldiers—those 23–25 and those 27–30—before and after implementation of the ACA. Figure 1 shows the average reenlistment rate for each group for every year in our sample. The blue line represents our “treatment group” of soldiers who are 23–25, while the green line represents our “control group” of soldiers who are 27–30. Before the ACA, younger and older soldiers reenlisted (when offered the opportunity) at nearly the same rates. After 2010, however, younger soldiers began to reenlist at a much lower rate, and this effect appears to persist over time. For the army, this meant reenlistments fell by more than 3,200 soldiers, requiring additional costs and time to recruit and train replacements. But can we attribute the fall in reenlistment rates to the ACA, or did it stem from something else?

One concern about these visual findings is that different characteristics of the soldiers could be driving the results. However, when we control for the soldier's gender, race, home state, and education level, our findings do not change at all. Another concern could be differences in reenlistment bonuses. In the army, soldiers of the same rank, branch, and month of contract expiration are assigned the same bonus. We included a control that allowed us to compare soldiers of similar rank and branch who differ only in age. While the magnitude of our result shrinks slightly, it remains sizable.

It is also possible our findings are a result of deaths in Iraq and Afghanistan. For example, if casualties

spike because of an increase in violence, younger soldiers may become more risk averse and less likely to reenlist. Alternatively, because unemployment was increasing during the Great Recession at the same time that the ACA took effect, some older soldiers may have been more likely to reenlist to avoid a difficult job market. Additionally, since some states were expanding Medicaid during this period, we may worry about how the generosity of the home state's welfare programs affected the decision to reenlist. However, when we add controls for each of these factors, our core results remain unchanged.

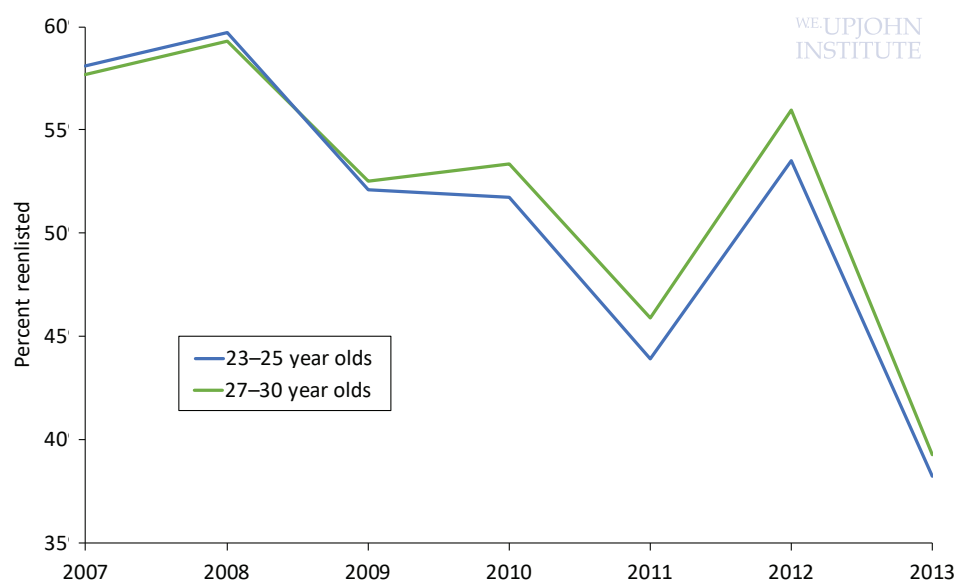
Finally, because the Great Recession led to an onslaught of new regulations and laws, the change in reenlistment rates could instead be affected by a policy change other than the ACA. To check this possibility, we simulate two “pretend” or “placebo” changes. First, we compare reenlistment rates of soldiers aged 27–30 with those aged 30–33; since neither age group was affected by the ACA, we would not expect their reenlistment rates

to change differently. Second, we compare the original early 20s and late 20s age groups, but we pretend that Congress passed the ACA in 2008 instead of 2010. Since this did not actually happen, we would not expect reenlistment rates to change differentially in 2008 and 2009.

After ACA passage in 2010, younger soldiers began to reenlist at a lower rate, and this effect appears to persist over time.

Indeed, when we change the ages of the treatment groups or the timing of the policy change, our results disappear. Thus, like a combination on a locker, we see changes in reenlistment rates only when we combine the right age group that was affected by the policy with the correct year in which the policy change occurred. These “placebo” tests are evidence that our results are a consequence of the ACA and not some other outside influence.

Figure 1 Reenlistment for Soldiers Aged 23–25 and 27–30, 2007–2013



SOURCE: Authors' calculations based on administrative data from the U.S. Army.

[Job] Locked and [Un]loaded**The Key to Job Lock?**

To show that the decrease in reenlistment is a product of job lock, it would be helpful to understand whether soldiers are leaving the army for increased opportunities, such as higher-paying jobs or additional schooling. Unfortunately, we have not linked our army data with income data,

While our results may be discouraging for the U.S. Army, they may be positive for individuals and the labor market.

but we can access GI Bill usage from the Department of Veterans Affairs. We find that soldiers who have access to their parents' health insurance are about 1 percentage point more likely to use their GI Bill benefits, from a base of 53 percent. This result shows that, with the increase in separate health coverage, soldiers are leaving the army for educational opportunities.

Our findings present an interesting conundrum for the Department of Defense and health care policymakers that might not be unique to the military. For example, we also find that the drop in reenlistment rates of younger soldiers who subsequently use their GI Bill benefits is concentrated among those with the highest military standardized test scores, suggesting that employers may be losing some of their most talented employees once job lock is removed. This loss is particularly painful for the army because the military does not allow "lateral" hires (i.e., management from outside the organization) among its active-duty personnel. For the army to have future senior leaders—from senior noncommissioned officers to colonels and generals—it cannot simply hire managers from the private sector, but must grow them from 20-year-olds who start their careers as privates (if enlisted) or lieutenants (if

commissioned officers). Thus, the army will need to increase its recruiting and retention spending to ensure that it manages its talent efficiently.

However, while our results may be discouraging for the U.S. Army, they may be positive for individuals and the labor market. We provide evidence that the ACA decreased labor market frictions from job lock. Once health insurance becomes portable (through eligibility for a parent's plan), the soldier—and possibly other employees—can now afford to pursue

acquiring additional human capital that may lead to better job prospects.

This article draws on research from an Upjohn Institute working paper, which can be found at https://research.upjohn.org/up_workingpapers/300/.

The views expressed herein are those of the authors and do not reflect the position of the United States Military Academy, the Department of the Army, or the Department of Defense.

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Upjohn Institute Report Offers Ideas To Help Communities Build Broadly Shared Prosperity

In 2018, the Upjohn Institute launched an initiative to learn how communities can help residents get and keep good jobs. Called "Promise: Investing in Community," the initiative marshaled Institute research

expertise in place-based college scholarships, workforce development and training, tax incentives, and customized business services.

This three-year initiative marks its first year with a report that summarizes what we've learned to date. The report, *Building Shared Prosperity: How Communities Can Create Good Jobs for All*, outlines strategies that small and medium-sized cities, along with rural areas, can follow to achieve broadly shared prosperity.

Communities help residents find and keep good jobs in two main ways: 1) by investing in workers through education and training, and 2) by investing in businesses through incentives and direct business assistance. Both approaches contribute to the same goal: more and better jobs, with benefits shared across demographic and income groups.

In this report, community leaders will find summaries of best practices, backed by evidence, in three broad categories: place-based scholarships; workforce training; and support to businesses. A fourth chapter offers lessons to help community leaders pull these best practices together into an overall strategy, rooted in their local assets and identity.

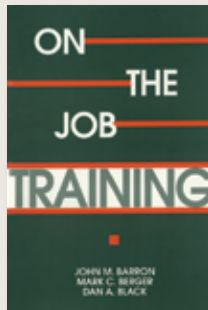
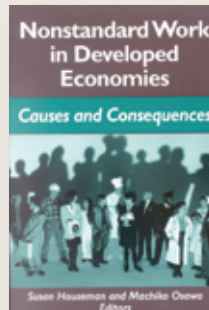
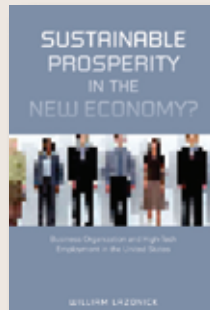
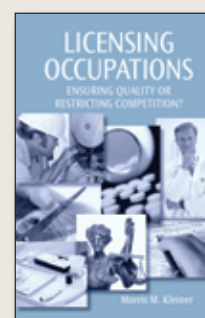
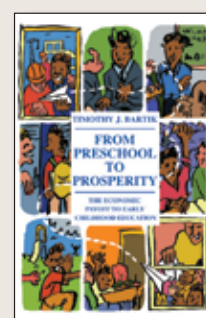
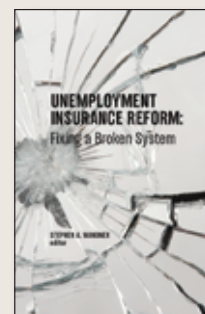
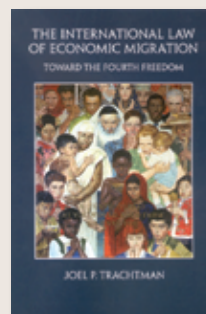
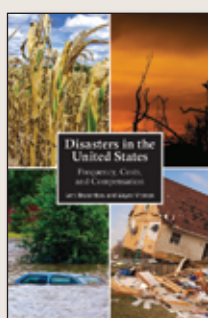
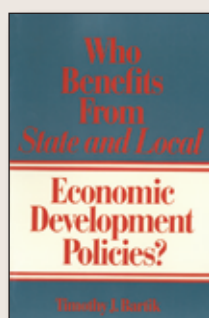
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"[Job] Locked and [Un]loaded: The Effect of the Affordable Care Act Dependency Mandate on Reenlistment in the U.S. Army."
Michael S. Kofoed and Wyatt J. Frasier. 2019. Upjohn Institute Working Paper 19-300. <https://doi.org/10.17848/wp19-300>

"Climate Change and Occupational Health: Are There Limits to Our Ability to Adapt?"
Marcus Dillender. 2019. Upjohn Institute Working Paper 19-299. <https://doi.org/10.17848/wp19-299>

"Payroll, Revenue, and Labor Demand Effects of the Minimum Wage."
Ekaterina Jardim and Emma van Inwegen. 2019. Upjohn Institute Working Paper 19-298. <https://doi.org/10.17848/wp19-298>

"Do SNAP Work Requirements Work?"
Timothy F. Harris. 2019. Upjohn Institute Working Paper 19-297. <https://doi.org/10.17848/wp19-297>

"An Apple a Day? Adult Food Stamp Eligibility and Health Care Utilization among Immigrants."
Chloe N. East and Andrew I. Friedson. 2019. Upjohn Institute Working Paper 19-295. <https://doi.org/10.17848/wp19-295>

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